Final Report and Implementation Plan - DRAFT

Presented to the Puget Sound Stormwater Work Group

Agricultural Runoff Subgroup

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This final report and implementation plan reiterates recommendations provided to the PS SWG regarding agricultural stormwater effectiveness monitoring, cropland nutrients and sediment, pesticides, and bacteria and nutrients from livestock operations. Implementation strategies recommended herein are intended to address the majority of the recommendations and leverage currently available programs and resources. Coordinated pursuit of funding opportunities and coordinated investment of available resources is needed to maximize the potential for success.

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Introduction and Background

The Puget Sound Stormwater Work Group (PS SWG) commissioned the formation of the Agricultural Runoff Subgroup (ARS) in early 2011 to consider expanding the *2010 Stormwater Monitoring and Assessment Strategy for Puget Sound* to address agricultural issues, building upon the *Recommendations for Municipal Stormwater Permit Monitoring* and other ongoing efforts. The subgroup first met in April 2011 and met regularly on a bi-monthly schedule except for a hiatus in activity between July 2014 and March 2015 due to staffing changes at the State Conservation Commission (SCC). Since March 2015, SCC staff has worked with ARS members to produce this report and implementation plan in smaller group work sessions.

Members of the subgroup, including those regular and periodic participants in select discussions, are: City of Everett, Snohomish Conservation District, Skagit County, USDA Natural Resources Conservation Service, Whidbey Island Conservation District, Department of Ecology, WA Department of Agriculture, Whatcom Conservation District, Skagit Conservation District, Western Washington Agriculture, Washington Dairy Federation, Mason Conservation District, EPA, Futurewise, Bainbridge Island, Taylor Aquatic Science, Thurston County, Clallam Conservation District, Samish Indian Nation, People for Puget Sound, and the Washington State Conservation Commission.

The process the ARS followed to make decisions or reach consensus was slightly different for each set of recommendations however, decisions were achieved via consensus of those present at the meetings. The decisions (recommendations) were sent out for review to all subgroup members. Questions from subgroup members not present at the meetings were posed to the group and answered/addressed via email. All of the recommendations were agreed to by the ARS without dissent.

The PS SWG tasked the ARS specifically to:

- Review the small streams and nearshore status and trends monitoring parameter lists and consider adding agricultural pesticides and or other parameters for analysis at status and trends sites located outside Urban Growth Area (UGA) boundaries.
- Design a regional source identification and diagnostic monitoring strategy for agricultural issues.
- Design effectiveness studies for agricultural BMPs.
- Describe how the monitoring might be funded and conducted (implementation plan).

The ARS has completed the first three tasks outlined above and has provided a set of recommendations to the PS SWG regarding pesticides, agriculture stormwater effectiveness monitoring, cropland nutrients and sediment monitoring, and bacteria and nutrients monitoring from animal operations. This final report and implementation plan is intended to memorialize the work by the ARS to date under the work plans set out by the Puget Sound Stormwater Work

Group as well as to lay out implementation strategies that could be pursued to further this work including descriptions of potentially suitable programs and funding sources.

Recommendations

Agricultural Stormwater Effectiveness Monitoring

The group proposed recommendations in two tiers. Tier 1 recommendations met all of the following criteria: more than one member submitted that particular study idea, others could use the information from the study, broader geographic scope, and greater ecological benefit. Tier 2 recommendations are more specific and limited to a smaller geographic scope and or measure of ecological benefit. The PS SWG approved these subgroup recommendations in June 2014. See Appendix A for additional details about the recommendations.

Tier 1 Recommendations:

- What is the effectiveness of the typical suite of agricultural BMPs on reducing pollutants via stormwater into Puget Sound streams?
- What is the effectiveness of drainage and stormwater –specific BMPs in reducing polluted run-off from agricultural lands?
- What is the effectiveness of ecological restoration to improve hydrology and other natural functions?
- What are the greatest barriers to landowner participation in agricultural and, where applicable stormwater-specific, BMP use?

Tier 2 Recommendations:

- What is the effectiveness of roof runoff structural practices, such as dry wells and hard-lining to a field ditch to avoid bird fecal contributions?
- What is the effectiveness of media filters (barley straw, compost, etc.) at reducing nutrients, sediment, and bacteria?
- What is the effectiveness of settling tanks to treat runoff from non-manured production areas, such as feed/commodity areas, then running the effluent through a field/filter strip?

Cropland Nutrients and Sediment Monitoring

The ARS determined via review of existing inventory data that croplands are located primarily in the North Puget Sound and several current monitoring programs already existing in the area were reviewed. These recommendations were approved by the PS SWG in March 2014.

- Coordinate existing sampling of sediments, nitrogen, and phosphorus with each other and with future sampling.
- Develop a strategy for data sharing, particularly for the NRCS edge-of-field monitoring.

- Baseline monitoring in marine waters should be done prior to installation of BMPs intended to reduce nutrient loads to provide a better understanding of the imports and exports from watersheds.
- Inventory sub-surface drainage structures, such as tiles, throughout Puget Sound and prioritize areas for repair or improvement..
- Additional monitoring (utilizing bracketing) of nutrients and sediment.

Pesticides

These recommendations were approved by the PS SWG in March 2013 following review and discussion by the ARS of status and trends monitoring parameter lists and PS SWG suggestions.

- A more targeted approach that combines source ID and program or watershed scale effectiveness monitoring is recommended over broad-scale monitoring such as status and trends which is not the most cost-effective method of monitoring pesticides in Puget Sound.
- Seek funding to augment the current Dept. of Agriculture pesticide monitoring program to use existing data to develop a model to estimate impacts due to peak flow events, then increase surface water sampling to test the model.
- Seek funding to conduct pesticide monitoring throughout other areas of the Puget Sound region (other than Skagit Co.) using a rotating panel of randomly-selected sites that are associated with different cropping patterns.

Bacteria and Nutrients

These recommendations were approved by the PS SWG in November 2012.

- Assure adequate support by: finding the necessary technical, political, and financial support that is needed throughout the process and, develop an effective community support system to ease the need for extensive regulatory oversight.
- Use broad-scale monitoring to prioritize problem areas at a sub-watershed level where detailed source identification monitoring and implementation will occur.
- For high priority areas, further define the problems, while obtaining community support by conducting community outreach to elevate the issue and obtain support and, collecting detailed survey information for all potential sources of impact in that area.
- Conduct source identification monitoring or bracket water quality monitoring around storm events to better characterize the sources of pollutants in these high priority areas.
- Implement best management practices (BMPs) to address the identified problems.
- Provide and encourage source identification monitoring for livestock impacts to use the guidance in Appendix A.

Implementation Strategy

The following are proposed actions or programs to further the recommendations made by the ARS.

Literature Review

The first step recommended by the ARS with respect to any of the recommendations outlined above is to conduct a literature review in each of the subject matter areas. The ARS would prefer to see effort and funding be directed first towards a literature review which in turn may inform refinement and prioritization of the recommendations for further implementation.

Collaboration with Ongoing Research and Monitoring Efforts

It is highly recommended that increased and focused collaboration be pursued among the various agencies and organizations engaged in research associated with the ARS recommendations as well as those engaged in or with interest in agricultural best management practice effectiveness monitoring such as the USDA Natural Resources Conservation Service, WSU Extension, and University of Washington. The Puget Sound Ecosystem Monitoring Program at the Puget Sound Partnership as well as Department of Ecology's Environmental Assessment Program are two key organizations currently conducting environmental assessment and monitoring work with multiple additional agencies and organizations also collecting environmental data such as Ecology, WSDA, WDFW, Tribes, and local governments such as cities, counties and conservation districts.

The Puget Sound Ecosystem Monitoring Program (PSEMP) is tasked with providing a coordination center for the various ecosystem monitoring and data collection efforts occurring in the region. Multiple recommendations of the ARS relating to cropland nutrients and sediment monitoring are associated with increased coordination and efficiency of monitoring efforts. Work remains to be done to fully integrate and coordinate all of the various ongoing efforts on a regional scale.

On a watershed or sub-watershed scale there are examples of coordinated water quality monitoring occurring that are working well. One example is the Clean Samish Initiative effort in Skagit County. The major entities and organizations involved in water quality monitoring in the Samish River watershed work together to periodically review water quality data in order to inform adaptive management decisions for the watershed. In this example, the primary data collection and analysis entity is Skagit County.

Another example is the focused watershed-scale work underway in Whatcom County under the Whatcom Clean Water Program. Multiple partners are participating in fecal coliform bacteria water quality sampling and monitoring including: Ecology, Whatcom County, WSDA Dairy Nutrient Management Program, Nooksack Indian Tribe, Lummi Nation, and Whatcom

Conservation District. Several existing programs are bringing resources to bear in the area to address sources of pollution. One of the focus areas for the Whatcom Clean Water Program is Drayton Harbor. In October 2016, 810 acres of shellfish growing area in Drayton Harbor were upgraded by the WDOH from conditionally approved to approved, a measure of success due at least in part to the collaborative and coordinated structure of the Whatcom Clean Water Program. These two examples could be emulated elsewhere in the region at a similar scale with a reasonable expectation of success.

Conservation Effects Assessment Project

The USDA Natural Resources Conservation Service (NRCS) implements a Conservation Effects Assessment Project (CEAP) program. "CEAP is a multi-agency effort to quantify the environmental effects of conservation practices and programs and develop the science base for managing the agricultural landscape for environmental quality."[1] NRCS has led ten Special Emphasis Watershed Assessments across the country since CEAP's inception in 2002. These assessments were focused on addressing specific resource concerns including the effectiveness of conservation practices in reducing soil erosion, nutrient and pathogen runoff. Currently, NRCS in Washington is not funded for this program. The ARS recommends pursuit of a Special Emphasis Watershed Assessment to provide further understanding of the effectiveness of a typical suite of agricultural BMPs in reducing pollutants to nearby waterways. Selection of a watershed(s) for assessment and the specific suite of BMPs for focus should be done by the NRCS and ARS in collaboration with the Puget Sound Stormwater Work Group. Considerations for selection of an appropriate area for study should include: HUC 8 or smaller geographic area, quantity and quality of data already available in the area, tidal influence if any, point sources of pollution in the area, and primary land use(s). Typical BMPs that may be considered for effectiveness study as part of a suite of BMPs include any practices found in the NRCS Field Office Technical Guide[2] including streambank vegetation restoration and waste treatment practices. The average cost of the Special Emphasis Watershed Assessments already completed is approximately $650,000. The cost for a Special Emphasis Watershed Assessment in the Puget Sound region will vary based on available resources from potential partners as well as the quality and quantity of applicable data already available.

Discovery Farms

Another recommended implementation strategy is to pursue expansion of the Discovery Farm program. The Discovery Farm concept initially began in the mid-west and now Discovery Farm programs exist in Wisconsin[3], Minnesota, North Dakota, and Washington. A Discovery Farm is a working farm that has entered into a contract to participate in a research/evaluation/demonstration program. Farmers agree to share the data collected on their

[1] http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap/
[2] http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/technical/
[3] http://www.uwdiscoveryfarms.org/home

farms as part of the Discovery Farm program agreement. Currently, two Discovery Farms exists in Washington. Expanding this program more broadly around Puget Sound would serve to address multiple facets of the agricultural stormwater effectiveness recommendations by providing on the ground opportunities to install and monitor specific BMPs.The primary cost of establishing a Discovery Farm is in the purchase and set up of appropriate monitoring equipment. Implementing Edge of Field Monitoring in conjunction with a Discovery Farm can provide some cost off-set for the farmer. Supplemental technical assistance and coordination funding of approximately $29,000 per farm is needed for initial set up. Annual maintenance, sampling, and data analysis costs are currently estimated at $10,000 per Discovery Farm.

Edge of Field Monitoring

The USDA NRCS offers cost share funding to agricultural producers under their Environmental Quality Incentives Program for edge of field monitoring practices. While the landowner remains the owner of the data collected from implementing edge of field monitoring, there are opportunities for the data to be shared when incorporated with a Discovery Farm agreement. This financial incentive for landowners to invest in monitoring equipment to collect real-time data about the runoff from their farms is a valuable tool for daylighting agricultural non-point issues. At this time, there are currently two landowners implementing edge of field monitoring in Washington in Whatcom County; however, NRCS recently conducted a sign-up period for this practice and three additional landowners have applied to participate. Edge of Field monitoring is expensive to implement and contracts for this practice average around $250,000 each and are for a term of five to nine years. This practice is a substantial investment for a farmer. The ARS would like to see the NRCS increase opportunities and funding for edge of field monitoring practices. Further encourage for landowners to engage in the Discovery Farm program to allow for sharing of the data collected, should be considered in the form of additional financial incentives or exemption from the per-landowner Farm Bill cap set at $450,000.

Pollution Identification and Correction (PIC) Programs

PIC programs managed by county health agencies are designed to identify potential sources of bacterial nonpoint pollution and then work with private landowners, including agricultural producers, to correct them. Bracket monitoring and in some cases, DNA analysis, are being used to identify sources. PIC programs can be an effective strategy to employ to provide focused effort in a particular watershed or sub-watershed. Conservation districts in the region work with county leads on PIC program implementation by providing technical assistance to agricultural producers and other private landowners and in some cases, financial incentives for BMP implementation. Despite examples that exist in the region of PIC program success in reducing nonpoint pollution, robust PIC programs do not exist in all counties in the region. Clallam County has not taken a lead role in establishing a local PIC program even though Clallam Conservation District has provided extensive support to the county by drafting a PIC program plan. PIC programs are generally at least partially funded by the WA Department of Health in

conjunction with local county-generated revenues. The ARS recommends supporting the formation and operation of robust PIC programs at the local level region-wide.

Precision Conservation Approach

The premise behind the precision conservation approach is to focus outreach and education efforts and financial incentives from multiple sources and programs to achieve improvement in natural resource conditions in a defined geographic area. This is similar in structure to PIC programs, the Clean Samish Initiative, and Whatcom Clean Water Program. The WSCC was awarded a Regional Conservation Partnership Program grant by NRCS in 2015 to implement the Precision Conservation for Salmon and Water Quality Program (Puget Sound RCPP), providing financial incentive funding for BMP implementation in high priority geographic areas in the region. In partnership with the WSCC, the Puget Sound Natural Resource Alliance and the Nature Conservancy produced the *Opportunity Assessment for Targeted BMPs in Puget Sound*[4] which identifies high priority areas for focused BMP implementation to address salmon habitat and water quality resource concerns. This technical report is helping to guide the Puget Sound RCPPThe WSCC and NRCS combine available funding under this program with many local partners that also bring resources to the table. To date, four action area projects are underway under this program: Skykomish River and Stillaguamish River (Snohomish County), Thomas Creek (Skagit County), and Newaukum Creek (King County). By concentrating efforts in this manner and including monitoring requirements, the WSCC anticipates demonstrating natural resource improvement. While the program is fairly new at the WSCC and project implementation has just gotten underway a similar approach has resulted in measureable success elsewhere. The WSCC has proposed to expand opportunities for similar focused watershed-scale projects to be implemented across the state in its 2017-19 biennial budget request

Funding Needs and Opportunities

Implementation of this plan will require pursuit of additional funding to accomplish many of the needs outlined in the recommendations including: conducting an inventory of sub-surface drainage structures on agricultural lands throughout Puget Sound, BMP implementation, and increased sampling efforts. See Appendix B for a table of potentially suitable funding opportunities.

Conclusion and Next Steps

This final report and implementation plan reiterates recommendations made by the ARS to the PS SWG in recent years and presents an implementation strategy that could be pursued to further the recommendations. Work remains to be done to increase coordination and collaboration around agricultural runoff effectiveness monitoring. Much of the implementation strategy noted

[4] http://scc.wa.gov/wp-content/uploads/2016/06/TechReport_Opportunity-Assessment-for-Targeted-BMPs-in-Puget-Sound_2016....pdf

here is dependent on funding to move forward. Coordinated pursuit of funding opportunities and coordinated investment of available resources is needed to maximize the potential for success.

Appendices

Appendix A: Agricultural Stormwater Effectiveness Recommendations, Cropland Nutrients and Sediment Monitoring Recommendations, Pesticides Recommendations, Bacteria and Nutrients Recommendations

Appendix B: Table of Potential Funding Opportunities

Appendix C: Conservation Effects Assessment Project Information

Appendix D: Discovery Farms Fact Sheet